

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
15 September 2005 (15.09.2005)

PCT

(10) International Publication Number  
**WO 2005/084378 A2**

(51) International Patent Classification: Not classified

(21) International Application Number:  
PCT/US2005/007084

(22) International Filing Date: 4 March 2005 (04.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/550,289 5 March 2004 (05.03.2004) US

(71) Applicant (for all designated States except US): **BOARD OF REGENTS OF UNIVERSITY OF TEXAS SYSTEM** [US/US]; 201 W. 7th Street, Austin, TX 78701 (US).

(74) Agents: **GARSSON, Ross, Spencer et al.**; Winstead Sechrest & Minick P.C., P.O. Box 50784, Dallas, TX 75201-0784 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

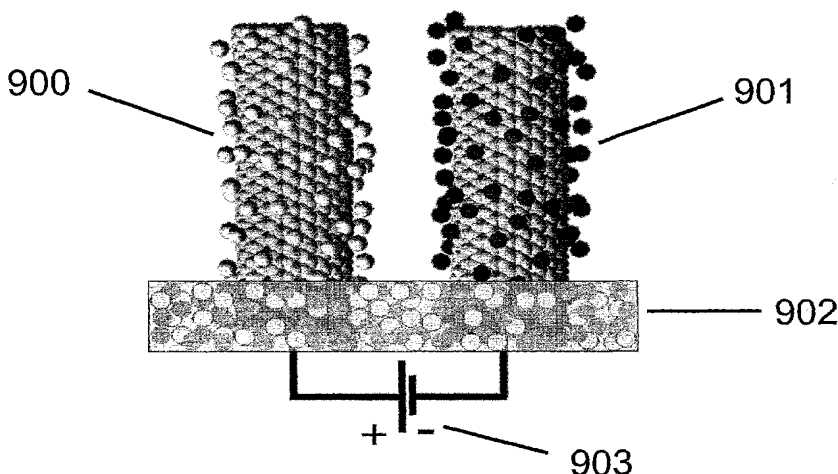
(72) Inventors; and

(75) Inventors/Applicants (for US only): **SUH, Dong-Seok** [KR/US]; 38-7, Seoul Garden Villa 701 Ho, CheongDam 2Dong, GangNam Gu, 135-951 Seould (KR). **BAUGHMAN, Ray, Herny** [US/US]; 5428 Willow Wood Lane, Dallas, TX 75252 (US). **ZAKHIDOV, Anvar, Abdulahadovic** [RU/US]; 1500 Berwick Drive, McKinney, TX 75070 (US).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: MATERIAL AND DEVICE PROPERTIES MODIFICATION BY ELECTROCHEMICAL CHARGE INJECTION IN THE ABSENCE OF CONTACTING ELECTROLYTE FOR EITHER LOCAL SPATIAL OR FINAL STATES



(57) Abstract: In some embodiments, the present invention is directed to processes for the combination of injecting charge in a material electrochemically via non-faradaic (double-layer) charging, and retaining this charge and associated desirable properties changes when the electrolyte is removed. The present invention is also directed to compositions and applications using material property changes that are induced electrochemically by double-layer charging and retained during subsequent electrolyte removal. In some embodiments, the present invention provides reversible processes for electrochemically injecting charge into material that is not in direct contact with an electrolyte. Additionally, in some embodiments, the present invention is directed to devices and other material applications that use properties changes resulting from reversible electrochemical charge injection in the absence of an electrolyte.

WO 2005/084378 A2



**Published:**

— without international search report and to be republished  
upon receipt of that report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*